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ABSTRACT

The comparison of adult literacy in the United States and in other countries is based on data gathered in interviews with a sample of individuals representative of the population aged 16-65 in twelve countries: Sweden, the Netherlands, Canada, Germany, New Zealand, Australia, the United States, Belgium, the United Kingdom, Ireland, Switzerland, and Poland. Respondents' literacy was measured using 114 literacy tasks found to be valid across cultures and reflecting three domains of literacy: prose, document, and quantitative. An introductory section gives background information on the study, definition of literacy, and methodology used in the survey. Subsequent sections contain the findings, in tables and narrative, concerning: national literacy averages and distribution of literacy skills at five levels; the relationship of literacy to employment status (unemployed, employed, out of workforce, student), occupational status (professionals, managers, technicians, clerical, sales/service, skilled craft, machine operators, agricultural/primary), and income, and the importance of literacy to individuals. Contains three references. (MSE) (Adjunct ERIC Clearinghouse on Literacy Education)

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Working Paper Series

Adult Literacy:

An International Perspective

Working Paper No. 97-33 October 1997

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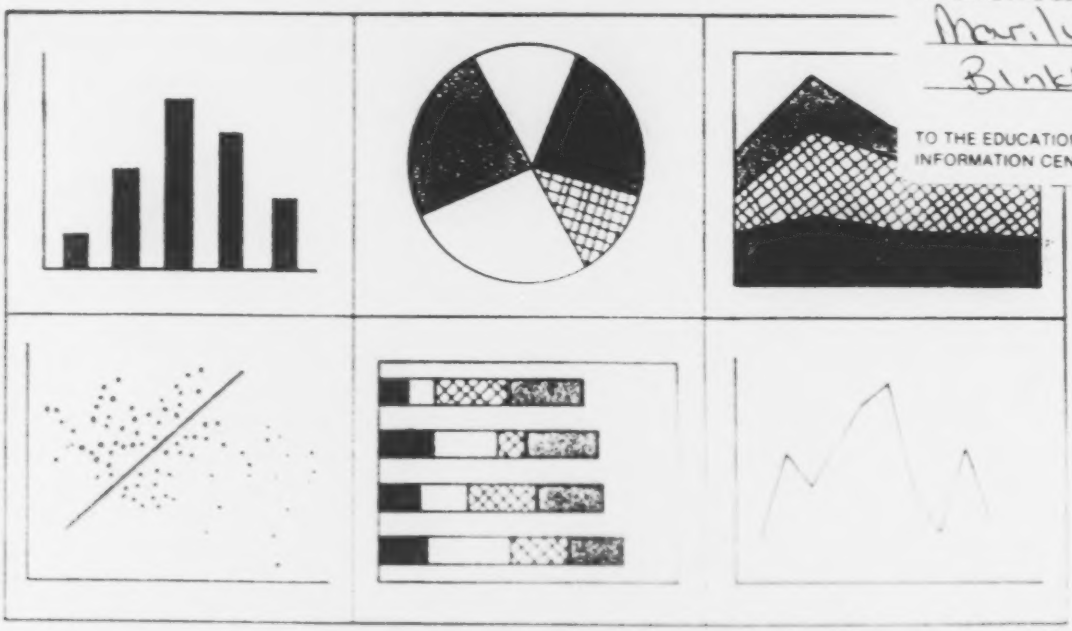

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Adult Literacy:

An International Perspective

Working Paper No. 97-33 October 1997

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October 1997

Foreword

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Adult Literacy:

An International Perspective

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Preface

This report is a working paper produced as part of a forthcoming larger report on adult literacy in the United States. In fact, this working paper presents, in draft form, the analyses and text of the first two chapters of the larger report to come. The first of the two chapters in question provides a comparison of the literacy levels of adults in 12 nations -- Canada, Germany, the Netherlands, Poland, Sweden, Switzerland, the United States, Australia, Flemish-speaking Belgium, Ireland, New Zealand, and the United Kingdom. The second of the two chapters takes this same comparative view of the relationship between literacy levels and, respectively, employment, occupational status and income, across all but one of these nations. (At this time the appropriate data for Australia are not available for publication.)

The full report will be released later this year and will contain, in addition to the chapters noted above, a discussion of the variation in literacy levels across across different industry-defined sectors of the labor force, and an extended discussion of the relationship between literacy and education.

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Introduction

On December 6, 1995, the Organization for Economic Cooperation and Development (OECD) and Statistics Canada released a report called *Literacy, Economy, and Society,* which compares literacy rates, the relationship between literacy and income, immigration, participation in the labor force, education, and literacy practices across seven countries. The report was based on the first international household study that included an actual assessment of the literacy skills of adults. The study was designed and implemented through a cooperative effort on the part of government agencies in each of the participating countries. Scientific breakthroughs in assessment design and psychometrics made it possible to compare, in the first instance, the distribution of literacy within Canada, Germany, the Netherlands, Poland, Sweden, Switzerland, and the United States. Subsequently, five additional countries – Australia, Flemish-speaking Belgium, Ireland, New Zealand, and the United Kingdom – replicated the International Adult Literacy Survey and so provided for additional comparisons. During November of 1997, the OECD and Statistics Canada released a second report including further analyses of the expanded set of data.

The data included in these reports illustrate that the overall literacy skills of Americans are similar to those of people from the other major industrial societies participating in the study. Sweden outperforms every other country and Poland does less well than every other country on each of the three scales. After that, clear rankings that have statistical significance become more difficult to describe. However, Americans, in all their diversity, achieve somewhere in the middle on each of the literacy scales. The Americans achieve at the same level as the Canadians, Germans, Australians, Flemish speaking Belgians, English, Irish, and the French and German speaking Swiss on the prose scale. And, on the document and quantitative scales the United States does as well as Canada, Flemish-speaking Belgium, French-speaking Switzerland, Australia, German-speaking Switzerland, New Zealand, the United Kingdom, and Ireland.

Despite similarities in mean literacy scores among subsets of participating countries, the distribution of literacy skills within all countries var-

ied considerably. In addition to providing scale scores, the International Adult Literacy Survey (IALS) literacy data is divided into five levels.[i] It is easiest to look at the distribution of literacy in terms of these five levels. The United States was most similar to Canada, New Zealand, and the United Kingdom in this respect. These three countries had close to 20 percent of their adult population at both the high and low ends of the literacy scale (levels 1, 4, and 5). In contrast, the performance of their European counterparts was concentrated in the middle literacy levels – at least two-thirds of the adult population in the Netherlands, Switzerland (both French and German speaking), and Germany were at literacy levels 2 or 3. While Sweden tended to have the greatest concentration at the higher end of the scale, Poland's adults were concentrated at the lower end.

Although the U.S. findings were similar to what Americans had learned from our own National Adult Literacy Survey (September 1993), the addition of the comparative data sheds further light on the competitive status of the U.S. population. These comparative data heighten our understanding of the importance of literacy skills to our population at work, in school, and at home.

Arriving at an international definition of literacy[ii]

Believing that literacy has become one of the fundamental tools necessary for successful economic performance in industrialized societies, and consistent with North American and Australian frameworks for literacy,[ii] countries participating in the IALS agreed to no longer define literacy as a dichotomy separating those who are literate from those who are not. Rather, literacy could more effectively be described in terms of a continuum related to "...how adults use written information to function in society."[1] This broader definition would be useful to governments and policymakers, because it would provide more information about the level and distribution of literacy across populations and could thus help shape appropriate literacy programs.

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[i] A complete description of each literacy level is provided in Chapter 1 of this report.

[ii] Within the United States, the view of literacy as a continuum of multiple skills can be clearly traced to the Young Adult Literacy Study (YALS) conducted in 1986, followed by a U.S. Department of Labor study in 1992, and the National Adult Literacy Study (NALS) done i n 1993. Both Canada and Australia also have defined literacy in this manner (The Creative Research Group 1987, and Statistics Canada 1991 in Canada, The Commonwealth Department of Employment, Education and Training 1989 in Australia.

The literacy assessment work within the United States, Canada, and Australia had demonstrated the possibility of developing wide-ranging scales of literacy performance within any one country. IALS extended that work by testing whether one could successfully describe and compare the literacy skills of adults from different countries. The challenge rested in determining whether there was something fundamental about literacy skills that transcended culture and language.

Originally national research teams from seven countries and three international organizations[iii] joined together under the leadership of Statistics Canada and the Educational Testing Service to develop a survey instrument that consisted of a background questionnaire and a set of more than 100 new literacy tasks. Empirical evidence revealed that the survey was a success and that countries could be compared with respect to their literacy skills. An independent quality review team recommended publication of these data.[iv] Later, 5 additional countries collected data that are now included in this report. Currently another 10 countries are collecting data.[v]

Measuring literacy in the International Adult Literacy Survey

IALS did not set a single international literacy standard, but rather followed the example set in the United States, Canada, and Australia of defining literacy in terms of a mode of adult behavior:

> *...Using printed and written information to function in society, to achieve one's goals, and to develop one's knowledge and potential.*

This definition allowed the inclusion of a broad set of information-processing skills used in performing many different tasks. IALS defined literacy in terms of three domains, each encompassing a common set of skills relevant for diverse tasks:

---

iii The participating international organizations were: the Organization for Economic Cooperation and Development through the Directorate for Education, Employment, Labor and Social Affairs; the European Union through the Task Force for Human Resources, Education, Training and Youth, Commission of the European Union; and UNESCO through the Institute for Education.

iv The independent quality review team consisted of Graham Kalton, Westat; Lars Lyberg, Statistics Sweden; and Jean Michel Rempp, National Institute of Economic and Statistical Studies. While its review indicated that there were a number of areas of weakness in the study, and it cautioned against possible areas where there might be bias, the team concluded that overall the study did maintain reasonable standards for an international comparative study and that the findings could and should be made public with the appropriate caveats indicated.

v The 10 additional countries are Chile, Czech Republic, Denmark, Finland, Hungary, Italy, Malaysia, Norway, Slovenia, and Italian-speaking Switzerland.

- *Prose literacy* – the knowledge and skill needed to understand and to use information from texts, including editorials, news stories, poems, and fiction.
- *Document literacy* – the knowledge and skill required to locate and to use information contained in various formats, including job applications, payroll forms, transportation schedules, maps, tables, and graphics.
- *Quantitative literacy* – the knowledge and skill required to apply arithmetic operations, either alone or sequentially, to numbers embedded in printed materials, such as balancing a checkbook, figuring out a tip, completing an order form, or determining the amount of interest on a loan.

In each of the three domains, a scale from 0 to 500 was constructed, with tasks of varying difficulty placed along the scale. A person's literacy ability in each domain could be expressed by a score. In addition, because the scale scores were then grouped into five empirically determined literacy levels, with each level implying an ability to deal with a particular subset of reading tasks, a person's literacy ability can be described in terms of the reading tasks they can do.

Conducting the survey

To conduct this study, interviewers went into people's homes to speak with them and to administer the IALS literacy test. The interview was designed and conducted to obtain detailed demographic information related to literacy in addition to the test.

Each country drew a probability sample from which results representative of the civilian, noninstitutionalized population aged 16 to 65 could be derived. In 10 of the countries whose data is included in this report, the survey was carried out in the national language; in Canada, respondents were given a choice of English or French; in Switzerland, samples drawn from French-speaking and German-speaking cantons responded in those respective languages (all other regions were excluded). In all countries, if respondents did not speak the designated language, attempts were made to complete the background questionnaire so that more accurate national estimates of literacy levels could be made.

To design a culturally unbiased test, each participating country was asked to submit appropriate materials. From those submissions, 175 *literacy tasks*

were constructed; of those, 114 tasks proved valid across cultures – and, therefore, were selected for inclusion. Because no one individual could be expected to respond to so many test items, each participant was given a subset of tasks carefully selected from the total pool in a way that would generate a reasonable mix of topics, types, and difficulties and that could be completed in approximately a 45-minute session.

The following report is a comparison of literacy across nations, with a focus on how the United States compares to other countries. Although 12 countries have completed data collection, not all have released data tapes. Consequently at this time the United States may only be compared to Australia, Flemish-speaking Belgium, Canada, Germany, Ireland, the Netherlands, New Zealand, Poland, Sweden, German and French speaking Switzerland, and the United Kingdom. In addition, in some cases comparisons are only possible with national statistics already appearing in published reports. Consequently, fewer countries are represented in these analyses.

Chapter 1

Comparing Literacy Across Nations

Ranking nations according to the achievement levels of their citizens always attracts attention because it touches on matters of national pride and raises concerns about the human capital available in each nation. Because issues related to human capital and the competitiveness of the labor force are at the heart of the International Adult Literacy Survey (IALS), this chapter provides a snapshot of how the United States compares to other developed countries on literacy.

There are at least three ways to compare the literacy of nations. First, it is possible to compare national averages. Second, one can look at the distribution of each national population across literacy levels. And, third comparisons of the proportion of the population across nations at each level can also be informative. Each is discussed in this chapter. In addition, descriptions of what adults at each literacy level on each of the scales can do are provided.

National averages

Figures 1.1a, b, and c list the national averages and standard errors for each country in descending order on separate measures of prose, document, and quantitative literacy.[i] More importantly, the figures also display differences that are statistically significant by indicating which countries have scores that exceed, are the same as, or are less than each reference country.

Based upon the comparisons in the figures, two findings are clear: Sweden outperforms every other country on each of the three scales and Poland does less well than every other country on each of the three scales. After that, clear rankings that have statistical significance become more difficult to describe.

Americans achieve somewhere in the middle on each of the literacy scales. When statistical significance is considered, Sweden, the Netherlands, and New Zealand do better than the United States on the prose scale. The Americans achieve at the same level as the Canadians, Germans,

i The notion that countries can be ranked in this way based solely on their national means is dubious at best. National means are based on samples, not whole populations, and have a degree of sampling variation associated with them. When we consider the effect of such sampling variation (as measured by the standard error) on national averages, as well as the very small differences between countries, the ranked differences could be due to sampling variability, rather than to real differences in the achievement of national populations. Consequently, these potential sampling errors must be taken into account before drawing conclusions about the relative performance of nations.

Figure 1.1a – Multiple comparisons of the mean literacy performance by scale, all nations: 1994, 1996; prose scale

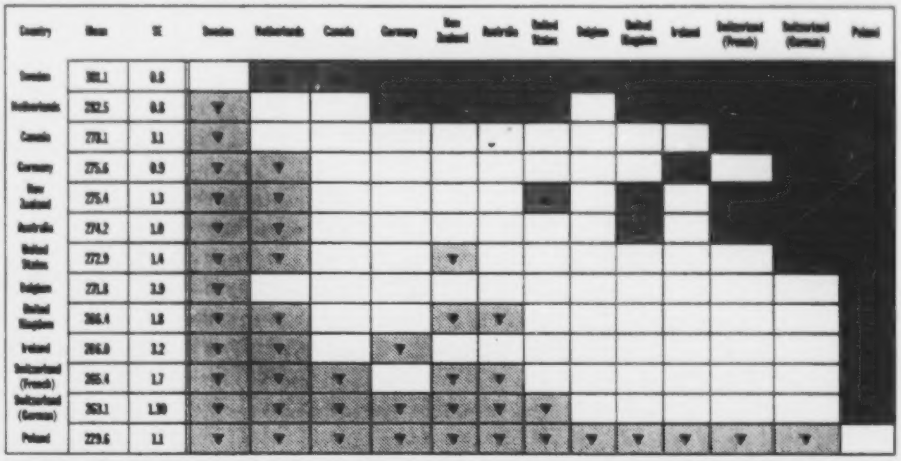


Figure 1.1b – Multiple comparisons of the mean literacy performance by scale, all nations: 1994-1995; document scale

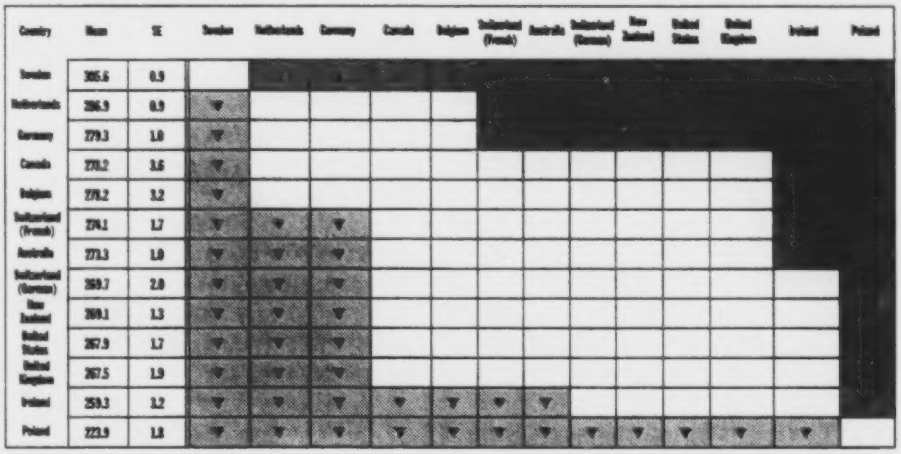
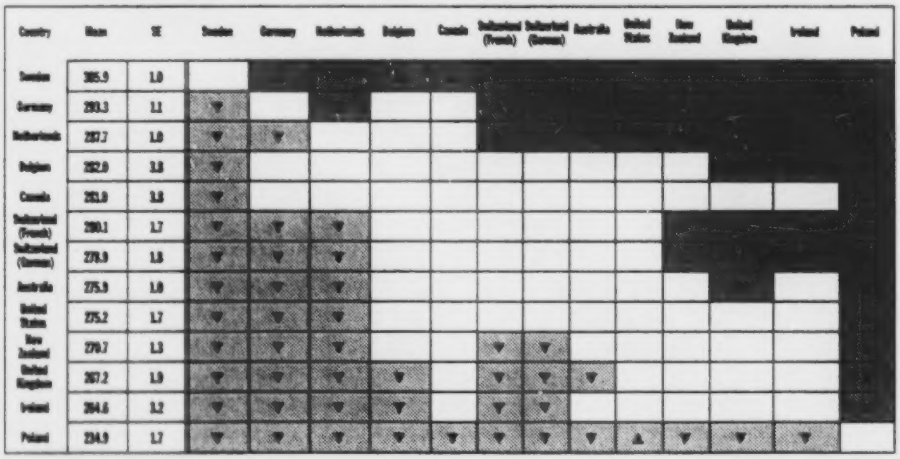


Figure 1.1c - Multiple comparisons of the mean literacy performance by scale, all nations: 1994-1995; quantitative scale



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

Australians, Flemish speaking Belgians, English, Irish, and the French-speaking Swiss. The Americans do better than the German-speaking Swiss and the Polish.

On the document scale, Sweden, the Netherlands, and Germany do better than the United States. The United States does as well as Canada, Flemish-speaking Belgium, French-speaking Switzerland, Australia, German-speaking Switzerland, New Zealand, the United Kingdom, and Ireland. The United States does better than Poland.

U.S. comparative performance on the quantitative scale is similar to its performance on the document scale – Sweden, Germany, and the Netherlands do better, Poland does less well, and all other participating countries perform at roughly the same level.

But, this comparative ranking is at best a crude description of adult literacy within and among countries. More complete information can be garnered from a look at how literacy skills are distributed across the populations of each country.

The national distribution of literacy skills

Differences in the distribution of literacy skills across countries are represented in Figures 1.2 a, b, and c. These figures present the estimated proportion of each country's population in each literacy level by literacy scale.[ii] Levels 1 and 2 are shown below the axis, while levels 3, and 4/5 are shown above the axis.

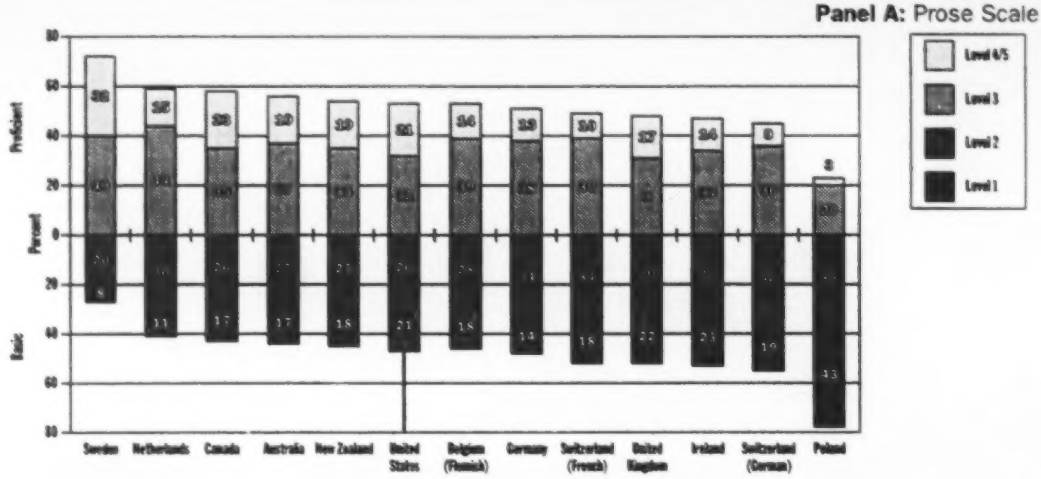
As was seen in the comparison of national means, two countries are distinctly different from all the others with regard to the distribution of literacy skills. Sweden consistently has the smallest proportion of is adult population in the lower levels (levels 1 and 2) and roughly three-fourths of their population in the upper levels (levels 3 and 4/5) (72% on prose, 75% on document and quantitative). In Poland, on the other hand, most of the population has lower literacy levels. Roughly seventy to 80 percent are grouped in the lower two levels (78% on prose, 76% on document, and 69% on quantitative).

The United States, Canada, New Zealand, and the United Kingdom are similar with regard to the distribution of literacy skills across their pop-

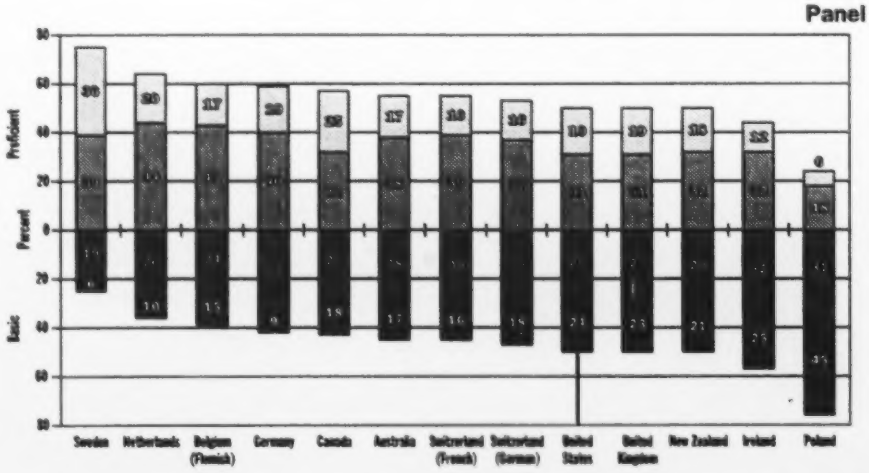
ii Levels 4 and 5 have been combined in these tables, because, in most countries, the proportion of the population at level 5 is under 5 percent.

Figure 1.2 – National literacy levels, percentage of adult population age 16 to 65, all nations: 1994, 1996.

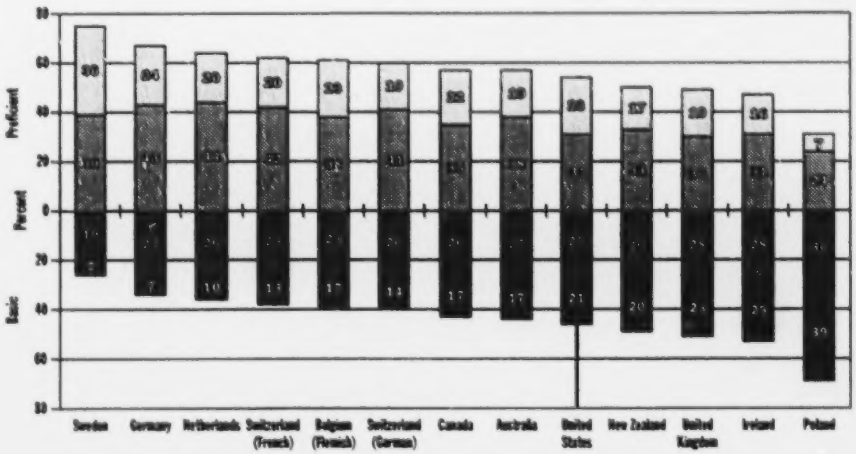
Panel A: Prose Scale



Panel B: Document Scale



Panel C: Quantitative Scale



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

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ulations. There is no statistically significant difference between the proportions of people at each level in the United States and each of these other countries except that each has a slightly larger proportion of people at level 4/5 on one of the three scales.

In all other cases, the comparisons between the United States and each other country vary based on the literacy scale under consideration.

What impact does the distribution of literacy skills on each of the scales within the United States have on our national well being and on our competitive position? To answer this question many factors – including an understanding of the skills people have, the market value of those skills, and whether there is a good match between those skills and the demands of the local workplace – must be considered. To begin to answer this question, it helps to understand the range of skills people at each level possess and to consider how the United States compares.

Literacy level 1

Literacy level 1 is the lowest level on the IALS literacy scales. In general, people who have attained no more than level 1 literacy skills can read relatively short pieces of text to find a single piece of information. They are often able to enter personal information on forms or to locate specific information in a table. In addition, they are frequently able to perform simple arithmetic operations, such as adding numbers on a bank deposit form. At best these can be considered basic skills.

Although all of the people in this group are not equally adept, there are two related conclusions to be drawn. First, a large proportion of individuals with level 1 literacy skills are not illiterate. They do, in fact, have many basic literacy skills. They can read the words on the page. They can understand and use information that appears in simple formats. Secondly, the skills associated with this level may not be sufficient for individuals to successfully participate in their communities. Level 1 literacy skills are often not sufficient for the reader to independently learn from text. People at this level can only find what is there when they already know what they are looking for. For an example of this level, see Exhibit 1.1.

Depending upon which scale is considered, between 21 and 24 percent of U.S. adults (roughly 37 million)[2] demonstrate the skills associated with

Exhibit 1.1 An example – Level 1 prose literacy

MEDCO ASPIRIN *500*

INDICATIONS: Headaches, muscle pains, rheumatic pains, toothaches, earaches. RELIEVES COMMON COLD SYMPTOMS.

DOSAGE: ORAL. 1 or 2 tablets every 6 hours, preferably accompanied by food, for not longer than 7 days. Store in a cool, dry place.

CAUTION: Do not use for gastritis or peptic ulcer. Do not use if taking anticoagulant drugs. Do not use for serious liver illness or bronchial asthma. If taken in large doses and for an extended period, may cause harm to kidneys. Before using this medication for chicken pox or influenza in children, consult with a doctor about Reyes Syndrome, a rare but serious illness. During lactation and pregnancy, consult with a doctor before using this product, especially in the last trimester of pregnancy. If symptoms persist, or in case of an accidental overdose, consult a doctor. Keep out of reach of children.

INGREDIENTS: Each tablet contains
500 mg acetylsalicicylic acid.
Excipient c.b.p. 1 tablet.
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SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, *Literacy, economy, and society,* Ottawa, Canada: Statistics Canada, 1995.

the lowest level of literacy. As seen in Figures 1.2 a, b and c, most English-speaking countries,[iii] have similar proportions of their populations at level 1. In contrast, Poland has a larger proportion of their population with these minimal skills. On the other hand, Sweden, Germany, the Netherlands and Australia consistently have a smaller proportion of their populations at this level. On two of the scales, quantitative and document, both French- and German-speaking Switzerland have a smaller proportion of their populations at this level.

From a competitive standpoint, if literacy skills are truly crucial to national economic well being, then the United States may be at a disadvantage as compared to a number of our European counterparts. However, other contextual factors play an important role as well.

iii Canada, Ireland, New Zealand, and the United Kingdom

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Literacy level 2

Although individuals with level 2 literacy skills can do somewhat more than those with level 1 literacy skills, their repertoire is still limited. In addition to having the skills associated with level 1 literacy, adults with Level 2 literacy skills can make low-level inferences based upon what they read; they can compare and contrast information that is easily found in text; they can discriminate between correct and incorrect plausible information in documents; and they can do single arithmetic operations after locating easily identified numbers that appear in printed materials. For an example of this level, see Exhibit 1.2.

Approximately one-fourth of all adults in the United States have attained level 2 literacy skills (roughly 39 million adults).[iv] As seen in Figures 1.2 a, b, and c, Sweden has a smaller proportion of its population at literacy level 2 on all three literacy scales than the United States and most of the other countries. Given the somewhat limited range of skills associated with this level, Sweden is in a comparatively favorable competitive position not only with regard to the United States, but also to most of the other countries.

On the prose scale, Australia, Belgium, Canada, Ireland, New Zealand, and the United Kingdom have about the same proportion of their populations as the United States at level 2. Germany, the Netherlands, Poland, and both French- and German-speaking Switzerland have a larger proportion of their populations at this level than the United States.

On the document scale, the United States, Australia, Belgium, Canada, the Netherlands, New Zealand, both French- and German-speaking Switzerland and the United Kingdom statistically are no different. While the United States has a smaller percentage of its population at this level than Germany, Ireland, and Poland.

Finally, on the quantitative scale, a smaller proportion of adults in the United States perform at level 2 than in Poland and a larger proportion than in Sweden. Otherwise, there is no statistical difference between the United States and any of the other countries, all of whom have roughly the same percentage of their populations at this level.

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iv This is true for all three domains of literacy.

Exhibit 1.2 An example – Level 2 quantitative literacy

The reader is directed to use the accompanying weather chart in a newspaper to determine how many degrees warmer today's high temperature is expected to be in Bangkok than in Seoul.

Literacy, Economy and Society

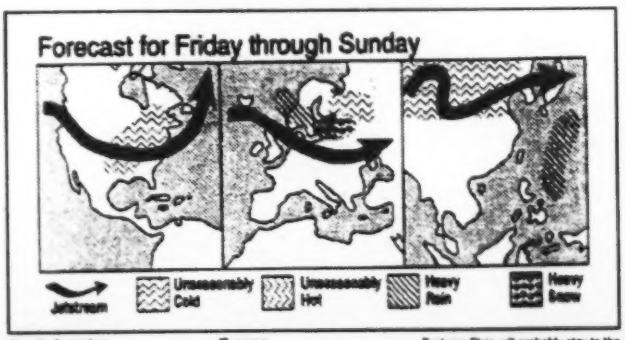
WEATHER

Europe

	Today High	Today Low	W	Tomorrow High	Tomorrow Low	W
	C	C		C	C	
Algarve	19	7	s	21	9	s
Amsterdam	11	6	pc	12	7	pc
Ankara	17	7	pc	19	8	pc
Athens	22	15	pc	23	14	pc
Barcelona	16	8	s	14	9	s
Belgrade	14	6	pc	10	1	c
Berlin	8	2	c	6	1	c
Brussels	11	6	pc	14	7	pc
Budapest	9	1	pc	9	2	c
Copenhagen	7	1	r	6	2	c
Costa del Sol	21	8	s	21	10	s
Dublin	10	6	pc	13	8	pc
Edinburgh	10	6	c	10	6	c
Florence	11	5	s	14	6	s
Frankfurt	12	6	pc	13	4	pc
Geneva	9	2	s	12	4	s
Helsinki	-1	-7	sf	-3	-10	pc
Istanbul	17	10	pc	15	9	sh
Las Palmas	26	18	pc	27	18	pc
Lisbon	19	9	s	19	10	s
London	12	5	pc	13	7	pc
Madrid	17	3	s	18	4	s
Milan	9	3	s	13	6	s
Moscow	1	-3	r	-3	-11	sf
Munich	11	3	pc	12	6	pc
Nice	14	7	s	15	8	s
Oslo	4	-4	c	5	-2	c
Paris	12	6	pc	13	6	pc
Prague	11	1	pc	8	2	c
Reykjavik	4	2	r	6	-1	c
Rome	20	12	s	20	10	s
St. Petersburg	-1	-7	sf	-4	-12	pc
Stockholm	1	-5	sn	-2	-7	c
Strasbourg	12	5	pc	15	7	pc
Tallinn	-1	-7	sf	-4	-10	pc
Venice	10	3	s	11	4	s
Vienna	9	-1	pc	10	2	c
Warsaw	8	2	sh	6	1	c
Zurich	8	0	s	9	1	pc

Oceania

Auckland	20	14	s	17	11	sh
Sydney	27	17	pc	25	18	pc



North America

Cold weather will engulf the Midwestern and Northeastern United States Friday and over the weekend. Although it will be cold in Chicago, Toronto and New York City, the weather is expected to be dry. Los Angeles will have some sunshine and seasonable temperatures each day.

Europe

Western and central Europe will have a spell of mild weather Friday into the weekend. London and Paris will have dry weather with some sunshine Friday into Sunday. Rain will continue to soak southwestern Norway. Snow will blanket the area from Minsk to Moscow.

Asia

Typhoon Elsie will probably stay to the east of the Philippines and south of Japan Friday and the weekend. Some rain is apt to fall in Seoul and there could even be a little ice or snow. Cold air will pour into Beijing and snow is a possibility. Hong Kong will start the weekend warm.

Middle East

	Today High	Today Low	W	Tomorrow High	Tomorrow Low	W
	C	C		C	C	
Beirut	28	19	pc	29	20	s
Cairo	29	20	pc	28	19	pc
Damascus	24	12	s	26	14	s
Jerusalem	27	15	s	26	14	s
Riyadh	34	13	s	32	13	s

Latin America

	Today High	Today Low	W	Tomorrow High	Tomorrow Low	W
	C	C		C	C	
Buenos Aires	23	11	pc	26	13	s
Caracas	29	20	s	31	18	s
Lima	23	17	c	23	16	c
Mexico City	23	11	sh	23	12	pc
Rio de Janeiro	32	22	s	29	21	sh
Santiago	24	4	s	22	6	pc

Legend: s-sunny, pc-partly cloudy, c-cloudy, sh-showers, t-thunderstorms, r-rain, sf-snow flurries, sn-snow, Hrcn, W-Weather. All maps, forecasts and data provided by Accu-Weather, Inc. © 1992

Asia

	Today High	Today Low	W	Tomorrow High	Tomorrow Low	W
	C	C		C	C	
Bangkok	32	22	pc	30	23	s
Beijing	11	0	s	8	2	pc
Hong Kong	30	23	s	29	22	pc
Manila	31	25	s	31	25	sh
New Delhi	31	13	s	32	16	s
Seoul	14	6	pc	14	4	pc
Shanghai	22	10	pc	24	12	s
Singapore	31	24	pc	28	23	sh
Taipei	26	21	pc	26	19	pc
Tokyo	18	9	pc	17	7	pc

Africa

Algiers	27	14	s	26	13	s
Cape Town	20	11	sh	18	11	pc
Casablanca	20	14	c	21	11	pc
Harare	34	17	s	32	18	pc
Lagos	30	24	pc	29	24	pc
Nairobi	27	12	pc	26	13	pc
Tunis	27	17	pc	17	14	pc

North

Anchorage	0	-2	c	3	0	sh
Atlanta	14	4	pc	8	2	pc
Boston	15	4	c	8	-1	pc
Chicago	2	-5	c	-2	-8	pc
Denver	8	-3	pc	4	-6	sn
Detroit	4	-2	c	4	-5	pc
Honolulu	31	20	s	31	21	pc
Houston	15	3	pc	12	6	pc
Los Angeles	28	14	s	24	13	s
Miami	30	22	pc	29	21	pc
Minneapolis	-1	-8	c	1	-7	pc
Montreal	7	-2	sf	4	-3	c
Nassau	31	22	pc	28	21	sh
New York	14	4	r	10	2	pc
Phoenix	23	11	pc	22	8	s
San Fran.	20	11	pc	21	8	s
Seattle	11	6	pc	13	7	r
Toronto	6	-3	c	3	-3	c
Washington	14	5	r	11	4	pc

SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, *Literacy, economy, and society*, Ottawa, Canada: Statistics Canada, 1995.

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Literacy level 3

Nearly one-third or about 50 million adults in the United States demonstrate performance that can be defined as level 3 on each of the literacy scales. In addition to the skills associated with levels 1 and 2, people who have level 3 literacy skills also demonstrate the ability to match pieces of information by making low-level inferences, and to integrate information from relatively long or dense text. They can integrate multiple pieces of information located in documents and can perform arithmetic operations by using one or more numbers located in printed material, and by interpreting arithmetic terms included in the question. For an example of this level, see Exhibit 1.3.

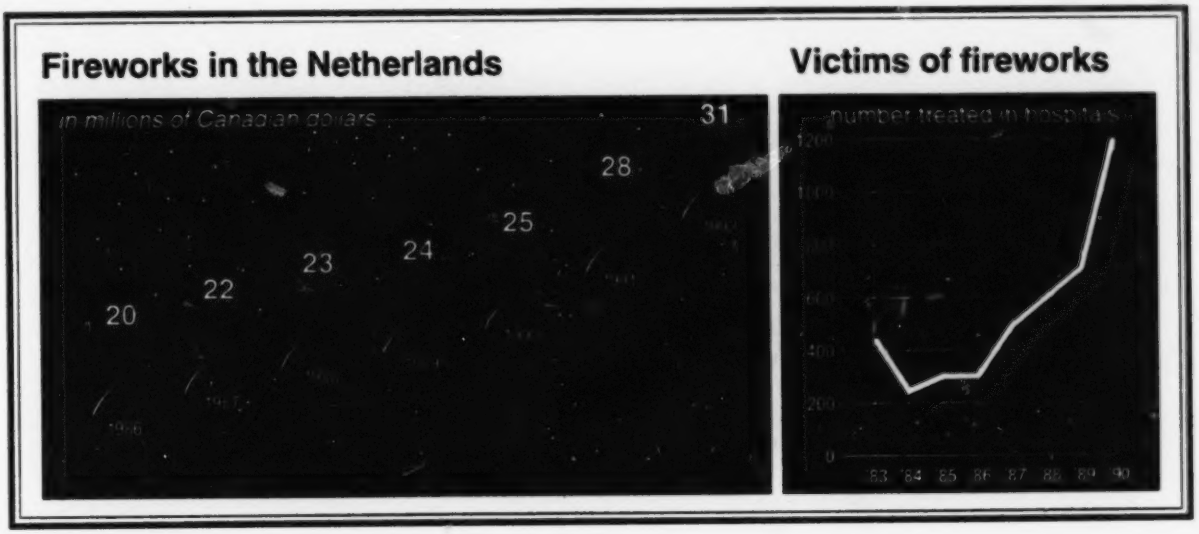
On all three scales, Australia, Germany, the Netherlands, Sweden, and French-speaking Switzerland consistently have a larger proportion of their populations at this level than the United States, as does German-speaking Switzerland on two of the three scales—document and quantitative literacy. Belgium exceeds the United States in the proportion of its population performing at this level on the quantitative scale.

Except for the Australians, the other English-speaking countries all have approximately the same proportion (roughly one-third) of their populations performing at level 3 on all three scales as the United States. Only Poland, with one-fourth of its population at this level, has a smaller proportion than the United States.

It may be argued that level 3 skills mark the transition to the ability to learn and generate new concepts or ideas from text, a skill deemed necessary in an information-processing environment. But, roughly one-half of the American population have not attained this level of literacy competence. While the same can be said about many of America's international competitors, that does not allay concerns about the potential inability of the American labor force to adapt to major changes in workplace demands that accompany the shift from an industrial to an information-processing society. Clearly, a number of America's European counterparts may be better positioned to meet the projected challenges.

Exhibit 1.3 An example – Level 3 document literacy

The task directs the reader to write a brief description between sales and injuries based on the information shown in the two graphs.



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, *Literacy, economy, and society,* Ottawa, Canada: Statistics Canada, 1995.

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Literacy levels 4 and 5

As noted in Figure 1.2, roughly one-fifth of the American population perform at literacy levels 4 and 5 (21% prose, 19% document, 23% quantitative). On all three scales, only Sweden has a larger proportion of their population at these levels (32% prose, 36% document, 36% quantitative).

On the prose scale Australia, Canada, and New Zealand are statistically similar to the United States, while Belgium, Germany, Ireland, the Netherlands, Poland and both French - and German-speaking Switzerland have less of their populations achieving at these levels.

On the document scale, while Sweden and Canada have larger proportions of their populations at these levels, and Ireland and Poland have smaller proportions of their populations, all other participating countries are statistically no different from the United States.

On the quantitative scale, Belgium, Canada, Germany, the Netherlands, both French- and German-speaking Switzerland and the United Kingdom look no different from the United States. Australia, Ireland, New Zealand and Poland have smaller proportions of their populations at these levels.

In each of the international reports presenting IALS data, levels 4 and 5 have been grouped together for analytic purposes. This report has followed that position when talking about national averages and the pattern of distribution of the populations across literacy levels. However, when examining what people can do at these levels, there are differences worth noting.

Individuals with level 4 literacy skills can synthesize information from lengthy or complex passages and can make inferences based on information in texts and documents. They successfully perform sequential arithmetic operations based on numbers they have located in different types of displays. These readers often make high-level inferences and draw on their background knowledge. See Exhibit 1.4.

Individuals who consistently function at level 5 can do quite a lot with written material (see Exhibit 1.5). These readers can contrast complex information from multiple sources, make high-level inferences and search for information in dense text. They can regularly use specialized knowledge and search through complex displays for pertinent information. They can determine the features of arithmetic problems by examining text (or based on their background knowledge) and then can perform the arithmetic oper-

Exhibit 1.4 An example – Level 4 quantitative literacy

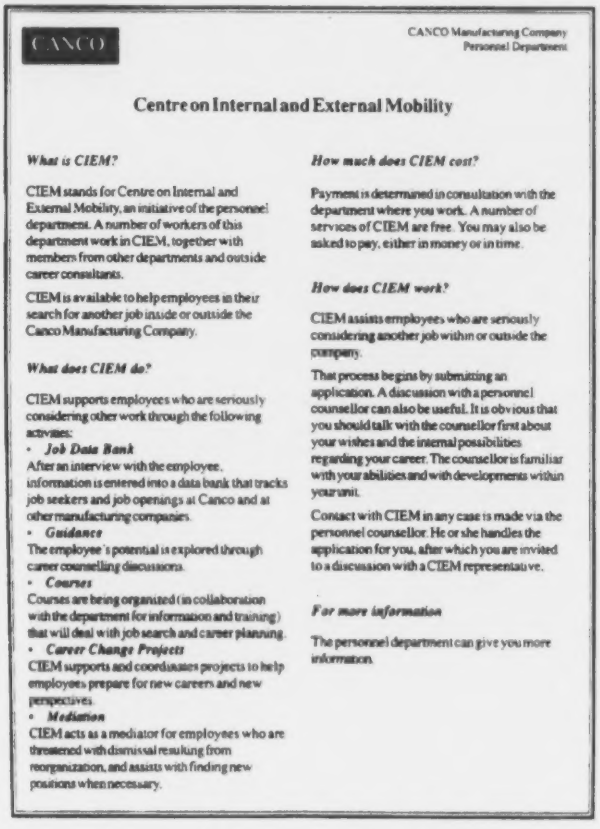
Readers were asked to calculate the total number of kilometers traveled in a trip from Guadalajara to Tecoman and then to Zamora.

TABLE OF APPROXIMATE DISTANCES (in kilometres)

Colima	Guadalajara	Manzanillo	Puerto Vallarta	Tecomán	Zamora
224					
98	322				
371	340	273			
45	269	62	330		
244	171	342	515	289	

Exhibit 1.5 An example – Level 5 prose literacy

The reader is to look at an announcement from a personnel department and list two ways in which CIEM helps people who will lose their jobs because of departmental reorganization.



CANCO

CANCO Manufacturing Company
Personnel Department

Centre on Internal and External Mobility

What is CIEM?

CIEM stands for Centre on Internal and External Mobility, an initiative of the personnel department. A number of workers of this department work in CIEM, together with members from other departments and outside career consultants.

CIEM is available to help employees in their search for another job inside or outside the Canco Manufacturing Company.

What does CIEM do?

CIEM supports employees who are seriously considering other work through the following activities:

- ***Job Data Bank***
After an interview with the employee, information is entered into a data bank that tracks job seekers and job openings at Canco and at other manufacturing companies.
- ***Guidance***
The employee's potential is explored through career counselling discussions.
- ***Courses***
Courses are being organized (in collaboration with the department for information and training) that will deal with job search and career planning.
- ***Career Change Projects***
CIEM supports and coordinates projects to help employees prepare for new careers and new perspectives.
- ***Mediation***
CIEM acts as a mediator for employees who are threatened with dismissal resulting from reorganization, and assists with finding new positions when necessary.

How much does CIEM cost?

Payment is determined in consultation with the department where you work. A number of services of CIEM are free. You may also be asked to pay, either in money or in time.

How does CIEM work?

CIEM assists employees who are seriously considering another job within or outside the company.

That process begins by submitting an application. A discussion with a personnel counsellor can also be useful. It is obvious that you should talk with the counsellor first about your wishes and the internal possibilities regarding your career. The counsellor is familiar with your abilities and with developments within your unit.

Contact with CIEM in any case is made via the personnel counsellor. He or she handles the application for you, after which you are invited to a discussion with a CIEM representative.

For more information

The personnel department can give you more information.

SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, *Literacy, economy, and society,* Ottawa, Canada: Statistics Canada, 1995.

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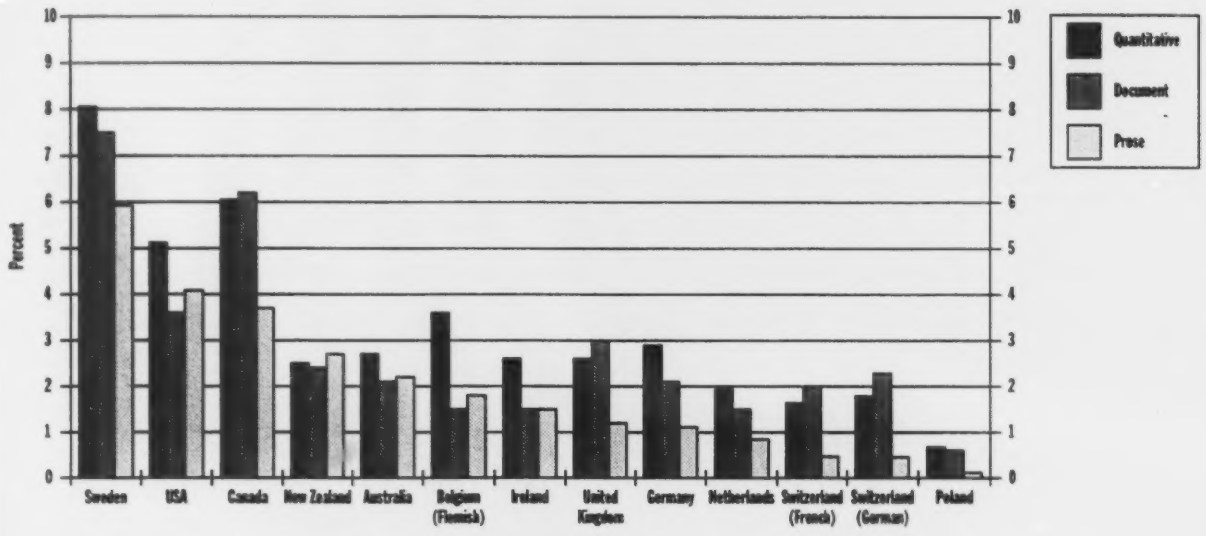
ations required to complete the problem. It is believed that these readers regularly think beyond the text and bring information from many sources to bear on what they are reading. Additionally, they consistently take information, ideas and concepts from what they read and apply these ideas to new problems.

As seen in Figure 1.3, internationally people who consistently perform at level 5 represent a small proportion of the overall population in all countries (never greater than 8 percent). As compared with other countries, the United States has a relatively high concentration of adults at literacy level 5. Only Sweden has a larger proportion of their population at this level on just one scale, the document scale. However, only between 4 and 5 percent of U.S. adults or roughly 5.7 million individuals reach this level. Because it is this group of people who most frequently create new knowledge, bring about innovations, and generate new ways of thinking, having even the slightly larger proportion of people at this level might be considered the source of a competitive advantage.

While this chapter has provided descriptions of the range of literacy abilities within nations, interpreting the meaning of these distributions and the impact of varying literacy abilities depends on what skills and abilities are necessary within the immediate environment. In an environment where books were not readily available, high-level literacy skills would be of no importance. On the other hand, where economic success and participation in the community were dependent on text materials, literacy skills become crucial. The following chapters examine how literacy relates to economic success and to labor force needs.

Figure 1.3 – National literacy level 5, all scales, percentage of adult population age 16 to 65, all nations: 1994-1996



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

Chapter 2

Literacy, Employment, Occupation, and Income

It is commonly believed that literacy skills[i] have a direct impact on a person's ability to participate successfully in the workforce and in society in general. Many even argue that the literacy skills of a nation's workforce have a great deal to do with the economic productivity and world market competitiveness of the nation now, and in the future. If these beliefs are true, as the United States evolves further into an information-processing society, literacy skills will increase in importance – playing a crucial role in the economic success of both individuals and the nation as a whole. Increasingly occupational and economic rewards during the life cycle, and quality of life in general, will come to depend on access to technology and information and the ability to manipulate both.

While this report cannot establish whether these beliefs about future economic viability will come to pass, the International Adult Literacy Study (IALS) data does demonstrate how literacy levels relate to occupational and economic attainments within the United States and across all seven participating nations.[ii] There are three sets of comparisons that shed light on the relationships between literacy skills and economic viability. The data allow comparisons between literacy levels and

- *Employment status* – in terms of an adult's relationship to the labor force;
- *Occupational status* – in terms of the prestige rankings[iii] assigned to occupational groups; and,
- *Economic attainments* – as reflected in the reported annual income of the individuals in question.

Literacy and employment status in the United States

The relationship between document literacy levels and the employment status of U.S. adults 16 to 65 years of age is shown in Figure 2-1.[iv] Figure

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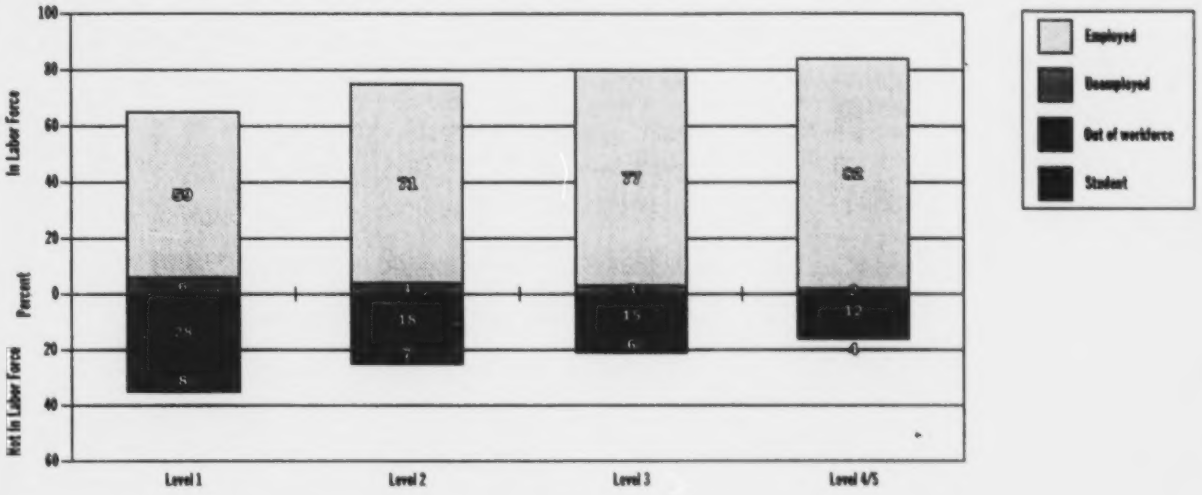
i In this context literacy skills include not only the capability to decode the written word but also the ability to interpret, synthesize, and act upon information gathered from multiple sources.

ii Although five additional nations joined IALS subsequent to the original surveys of seven nations, at the time of writing, data on the matters examined in this chapter were available only for the original seven nations. Subsequent analyses will extend the findings reported here to include all participating nations.

iii Occupations and groups of occupations can be assigned prestige rankings that represent public perceptions of the general social standing, or desirability, of occupations. Typically, medical practitioners, independent lawyers, judges and the like top the list while occupations at the other end of the scale tend to be varieties of unskilled labor.

iv Here, as elsewhere, literacy levels are defined with level 1 the lowest and level 4/5 the highest. Detailed descriptions of the skills defining each level are to be found in Chapter 1 of this report.

Figure 2.1 – Percentage of U.S. adults, age 16 to 65 in each labor force status by document literacy level: **1994**



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

2.1 displays for each literacy level, the percentage of adults in each of four labor force statuses:

- *Employed;*
- *Unemployed* – the respondent was currently out of a job but was actively looking for a new one;
- *Out of the workforce* – the respondent was not currently working, was not looking for another job, and was not a student; and
- *Student.*

Two things stand out at first glance. First, the percentage of people out of the workforce at level 1 (28 percent) is greater than the percentages at levels 3 and 4. The percentages of levels 2, 3, and 4/5 people out of the workforce are not significantly different from each other. (The differences between group's unemployment[v] rates are small and not statistically significant.)

Second, this pattern is reflected in the proportions of employed adults at each literacy level. At level 1 the percentage is 59 percent, a proportion significantly lower than those at levels 3 and 4/5 but not different from

v Unemployment is distinguished from "out of the workforce" by the additional criterion that the unemployed are looking for work whereas the "out of the workforce" group are not looking for work.

that at level 2. Moving up the levels, the proportions at levels 2 and 3 are not different from each other, but the 71 percent at level 2 is significantly less than the 82 percent at level 4/5.

Figure 2.1 displays, for each literacy level, the percentage of adults in each of four labor force statuses – employed, unemployed, out of the workforce, and student. The two former groups are usually counted as part of the labor force, and the latter two groups are considered "not in the labor force." Figure 2.1 shows this distinction by placing employed and unemployed adults above the axis, and the remaining two groups below the axis. In the figure the bar representing each literacy level has four segments corresponding to these four labor force status groups, and the percentage of persons in each segment is indicated.

This means that adults at the lowest literacy level are less likely to be employed than those who demonstrate more complex skills and are more likely to be out of the labor force altogether rather than unemployed. About one-fourth (27 percent) of adults whose literacy skills are limited to those defined as level 1 are not working and are not looking for work. Some of these will be retired, or engaged in home duties, or in similar activities. Others may be what are sometimes called "discouraged workers," people who were classified as unemployed at one stage but who gave up looking for work. Therefore, it appears that there is a higher probability that people in the United States who have the lowest literacy skills will be out of the workforce altogether. Whether this is true for other nations is considered next.

Literacy and employment status across nations

Figure 2.2 represents the relationship between document literacy levels and the employment status of adults 16 to 65 years of age in each of the seven original participating nations. Generally speaking, as one compares panel a to b to c to d, two trends stand out. First, within each nation as literacy levels increase there appears to be a decrease in the proportion of adults who are out of the workforce. As described in the case of the United States where the percentages are 27 percent at level 1, 18 percent at level 2, 15 percent at level 3 and 12 percent at level 4/5, the same trend appears within the data from other countries. For example, in the case of the Netherlands while 49 percent of those with level 1 skills are out of the workforce, the proportion decreases to 36 percent at level 2, 20 percent at level 3, and 12 percent at level 4/5.

Similarly, as was the case in the United States, this trend is mirrored by an increase across literacy levels in the proportion of adults who are working. Where as in the United States 59 percent of those at level 1 are employed as compared to 82 percent of those at level 4/5, in the Netherlands 38 percent of those at level 1 are employed as compared to 73 percent at level 4/5.

Although the trends are similar across nations, the proportions vary, especially at literacy level 1. For example, close to one-half of all adults in the Netherlands at literacy level 1 are out of the workforce relative to a little more than a quarter of the least literate adults in the United States or Switzerland. Statistically, these differences from the United States are only significant in the case of Germany and the Netherlands. At literacy levels 1 and 2 the percentages of adults in these two countries classified as out of the workforce are higher than the United States. In the case of Germany this is also true for level 3, which shows a significantly higher proportion of adults out of the workforce relative to their counterparts in the United States. The United States, on the other hand, has significantly higher percentages of the adult population at each literacy level employed relative to Germany and at each level except level 4/5 in the case of the Netherlands.[vii]

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vii With only one exception the unemployment levels of other nations do not differ significantly from those of the United States across comparable literacy levels; that is, comparing level 1 with level 1 and so on. Only Poland has a higher unemployment rate at level 2 than in the United States.

Figure 2.2a – Percentage of adults age 16 to 65 in each labor force status, by document literacy level, by nations: 1994; level 1

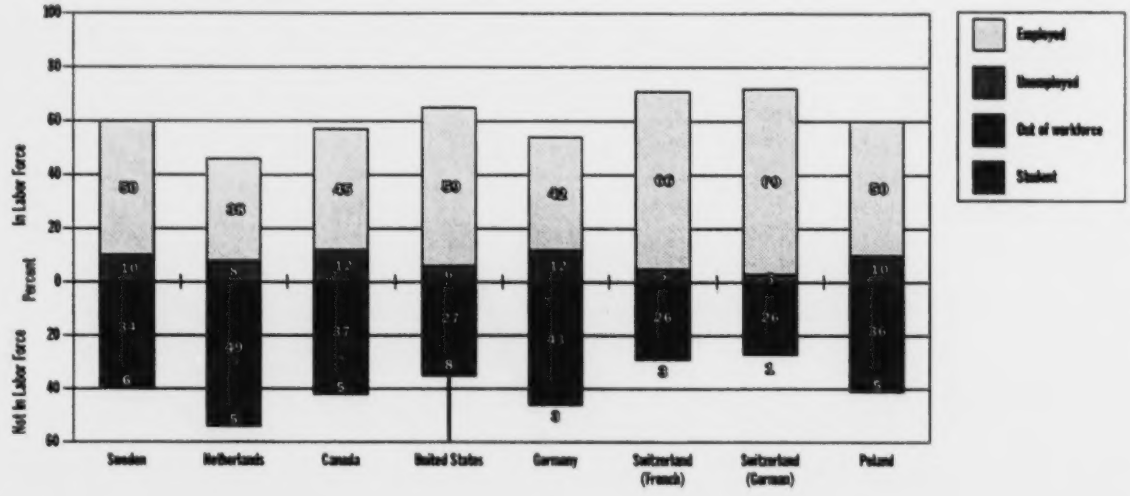
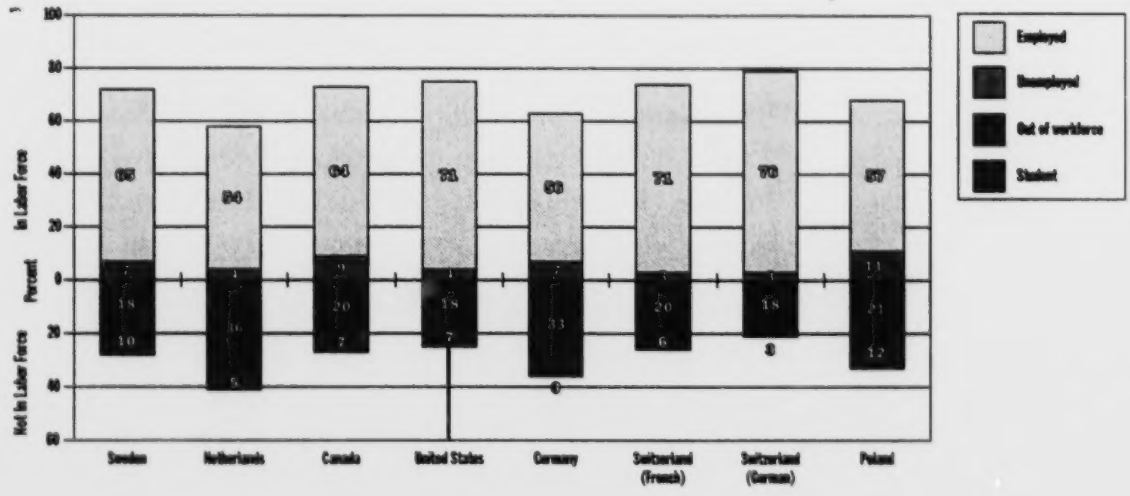


Figure 2.2b – Percentage of adults age 16 to 65 in each labor force status, by document literacy level, by nations: 1994; level 2



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

Figure 2.2c – Percentage of adults age 16 to 65 in each labor force status, by document literacy level, by nations: 1994; level 3

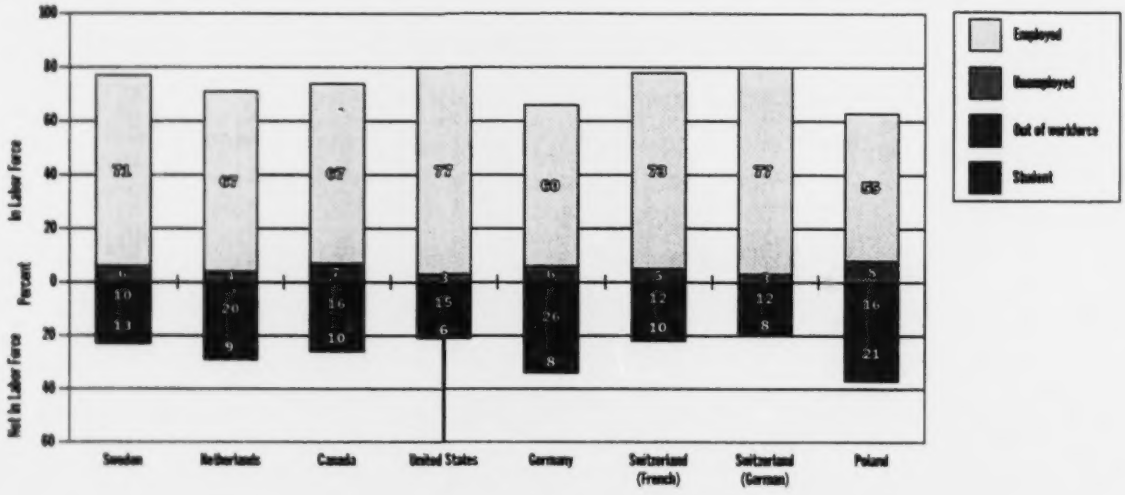
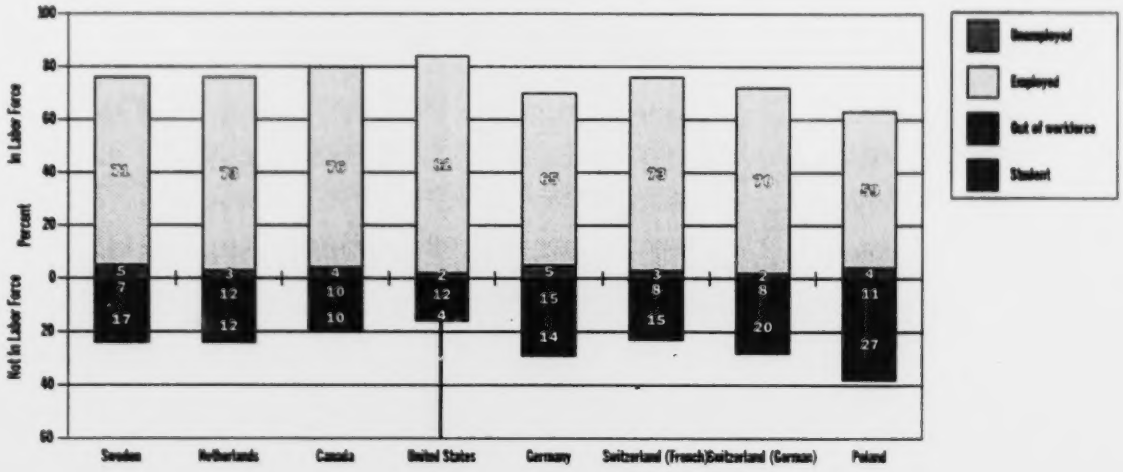


Figure 2.2d – Percentage of adults age 16 to 65 in each labor force status, by document literacy level, by nations: 1994; level 4/5



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

Note: Figures 2-2a,b,c, and d show analogous information for all nations separately by literacy level. That is, Figure 2-2a displays the proportion of level 1 adults in each labor force status for all seven countries. Figure 2-2b displays analogous information for adults at literacy level 2 in each of the nations, and so on. As before those categories classified as part of the labor force are shown above the axis, and the two groups not regarded as part of the labor force are pictured below the axis.

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Literacy and occupational status in the United States

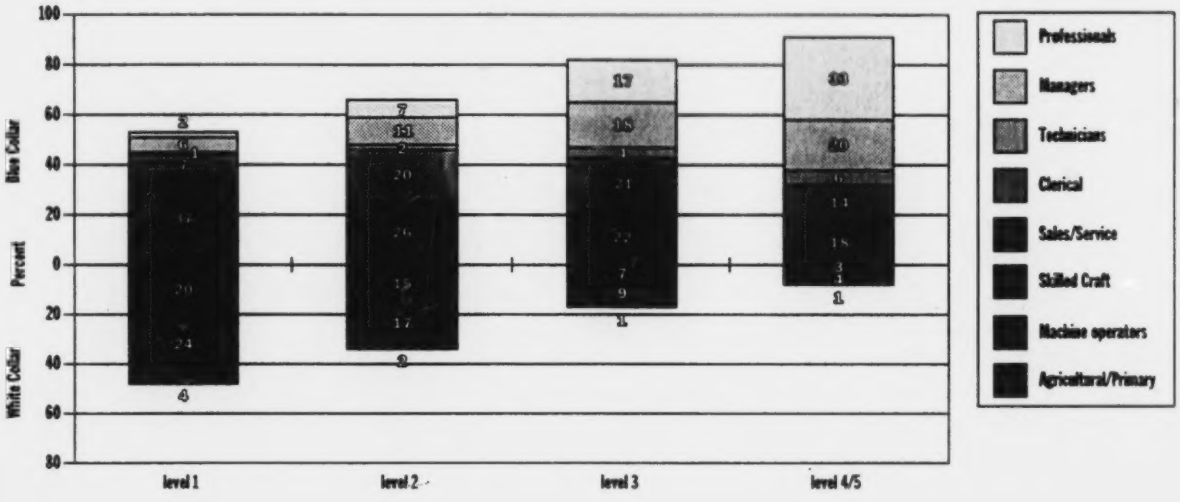
In addition to being related to whether one is in or out of the labor force, literacy skills may play a part in determining what occupation a person is likely to pursue as well as how successful they might be in that job. Using IALS data it is possible to examine the relationship between literacy skill levels and occupation. For the purposes of the IALS survey, occupations were classified as professional, managerial, technician, clerical, sales and service, skilled craft workers, machine operators, and, agricultural and primary occupations. In addition to following the International Standard Classification of Occupations,[1] grouping occupations in this way resembles occupational prestige orderings of occupations arrived at from public perceptions of the general social standing, or desirability, of occupations.[2]

For each of the four literacy levels the percentages of adults within each occupational group is indicated in the segment of the bar referring to that literacy level. For example, 37 percent of U.S. adults performing at the lowest of the four literacy levels are in sales/service-related occupations; 2 percent report being in professional occupations; 20 percent are skilled craft workers; and so on. In this display the occupations are also grouped into broader "blue-collar" and "white-collar" groups. Skilled craft workers, machine operators and agricultural/primary industry workers, considered the blue-collar categories, are displayed below the horizontal axis, while all other classifications, considered the white-collar categories, are above the horizontal axis.

Figure 2.3 shows the distribution of adults within the United States across the eight occupational status groups within each literacy level. This display makes it clear that as one moves from literacy level 1 through to level 4/5 the proportion of adults in blue-collar occupations decreases substantially – from close to 50 percent of all adults at literacy level 1 down to a total of 8 percent of those adults at level 4/5.

Craft workers and machine operators make up the greater proportions of the blue-collar group and their relative proportions within each literacy level generally decrease as one moves from the lowest to the highest literacy levels. The same trend exists among the sales/service group of white-collar occupations. Where nearly 40 percent of level 1 adults are in sales/ser-

Figure 2.3 – Percentage of U.S. adults age 16 to 65 in each occupational status group by document literacy level: **1994**



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

vice related occupations this drops to 22 percent at level 3 and to 18 percent among those at literacy level 4/5.

In contrast, the proportion of adults in the managerial and professional occupations increases in parallel with increasing literacy levels. While adults in managerial occupations make up 6 percent of the literacy level 1 group, they are 18 percent of those at level 3 and 20 percent of those at level 4/5. The proportion of adults in professional occupations also grows – from 2 percent at level 1 to 17 percent at level 3 to 33 percent at level 4/5.

This American data might be taken to indicate the importance of literacy skills for managerial/professional occupations, and a somewhat lesser degree of importance for sales/service and clerical occupations, consistent with the general notion that occupations vary in their demands on literacy just as they vary in their demands for fine-motor skills, physical strength, or interpersonal skills. It might also reflect the underlying notion behind a more recent view for categorizing of occupations in terms of data/people/things.[viii] This categorization scheme stresses the different types of skills

viii These characterizations are developed in the *Dictionary of Occupational Titles* (U.S. Department of Labor, 1965) and in the related characterization developed by Osberg et al. (1989).

Figure 2.4a – Percentage of adults age 16 to 65 in each occupational status group, by document literacy level, by nations: 1994; level 1

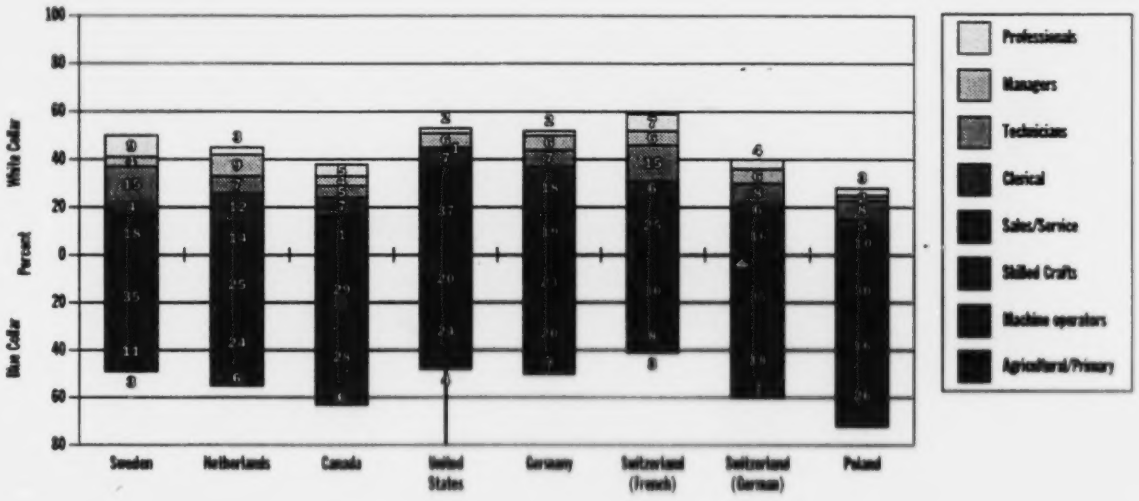


Figure 2.4b – Percentage of adults age 16 to 65 in each occupational status group, by document literacy level, by nations: 1994; level 2

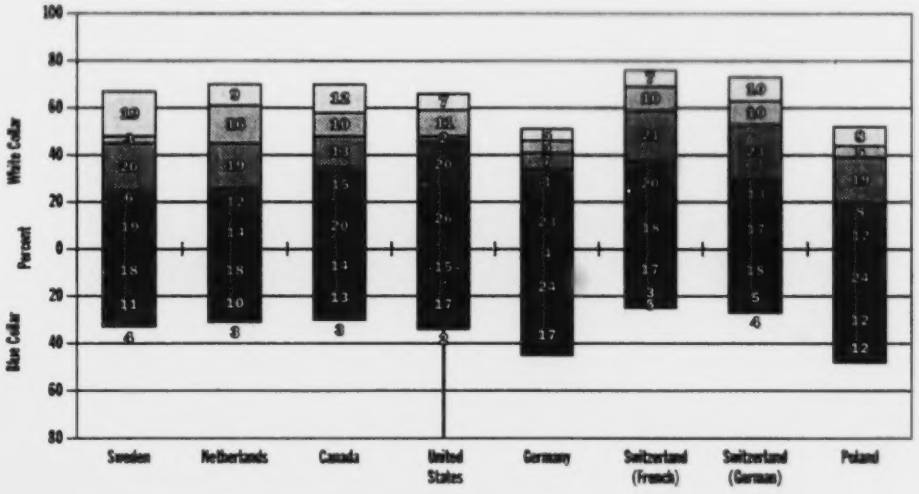


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Figure 2.4c – Percentage of adults age 16 to 65 in each occupational status group, by document literacy level, by nations: 1994; level 3

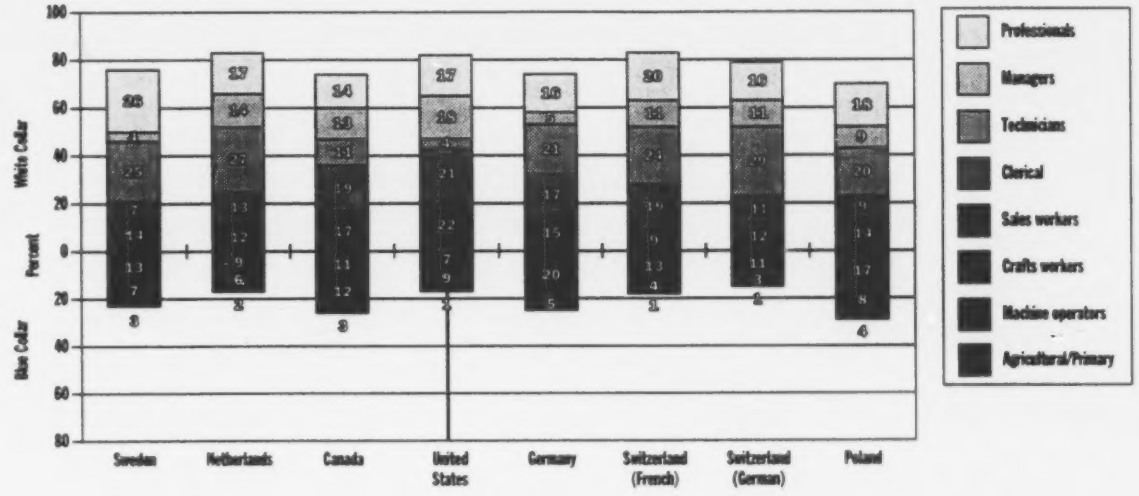
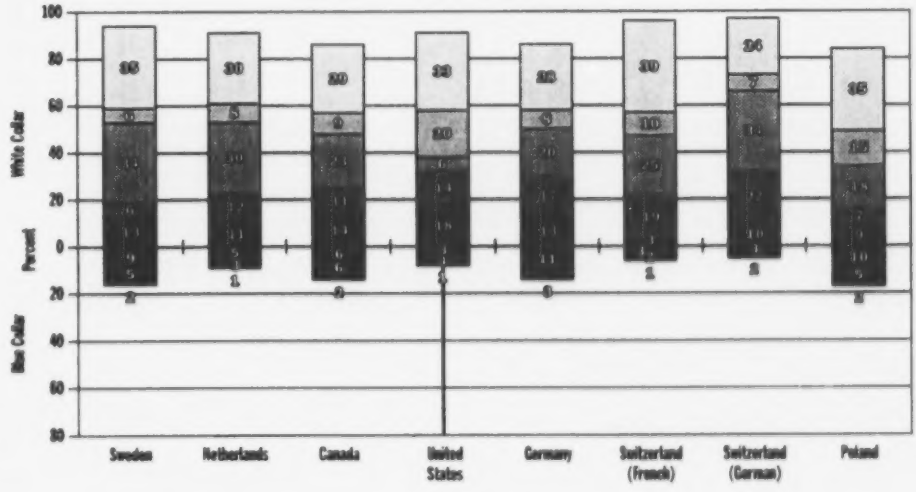


Figure 2.4d – Percentage of adults age 16 to 65 in each occupational status group, by document literacy level, by nations: 1994; level 4/5



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

Note: Figures 2.4 a, b, c, and d show analogous information for all nations separately by literacy level. That is, Figure 2.4 a displays the proportion of literacy level 1 adults in each occupational status group for all seven countries. Figure 2.4b displays analogous information for adults at literacy level 2 in each of the nations, and so on. As in the case of Figure 2.3, occupations are identified broadly as blue-collar and white-collar, these groups being distinguished by being respectively below and above the horizontal axis.

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needed for particular occupations. However, this would be better studied in relation to the distribution of workers within an industrial sector. This idea is explored in the next chapter.

Literacy and occupational status across nations

Figures 2.4 a, b, c, and d demonstrate that although countries may differ quite substantially in terms of the distribution of occupational status within any one literacy level, the general decrease in the proportion of adults in blue-collar occupations associated with an increase in literacy level is evident for all countries. For example, in the case of Poland, while 72 percent of those adults with literacy level 1 skills would be considered blue-collar workers, that proportion drops to 17 percent among those who have literacy level 4/5 skills.

At literacy level 1 perhaps the most notable finding is that the United States has a significantly greater proportion of sales/service workers than any of the other nations except the French-speaking community of Switzerland. Perhaps this reflects the growth of the personal service industry in the United States along with a decline in demand for relatively unskilled labor from traditional blue-collar occupations in manufacturing, such that the least skilled of adults are finding employment in relatively unskilled personal service occupations. Alternatively, the demand for personal service and the supply that meets that demand may simply be higher in the United States than in other nations.

As a general trend, at literacy level 2 the proportion of blue-collar workers substantially decreases for all nations other than Germany. In this case the percentage of blue-collar workers is only six points below what it is at literacy level 1. Some 45 percent of German adults at literacy level 2 are working in blue-collar occupations. Other differences between nations show no obvious pattern though, as expected, the proportion of adults in white-collar occupations grows further at the expense of blue-collar occupations. Most notably, and not unexpectedly, this increase occurs at the upper end of the status scale, in professional occupations.

At literacy level 4/5 only 9 percent of U.S. adults are in blue-collar occupations, a decrease from the 48 percent apparent at level 1. The same marked decrease is apparent in Sweden where 49 percent of adults with

level 1 literacy skills are in blue-collar occupations as compared to just 16 percent at level 4/5. This consistent evidence for the relationship between literacy and occupational status is reinforced by the observation that between one-third and one-half of adults in all participating countries able to perform at level 4/5 are in professional or managerial occupations.

Overall then the distribution of occupations across countries within literacy levels follow a broadly similar pattern, a pattern that demonstrates the relationship between literacy skills and occupational status – in all nations, adults with high levels of literacy are to be found disproportionately in high status occupations.

Literacy and income in the United States

Literacy skills are part of the qualifications a potential employee brings to the labor force. The importance of literacy skills in the workforce depends on the particular occupation. For example, people who regularly deal with data are more likely to need literacy skills than people who work on a factory production line. Given the relationship between literacy level and occupation, where those who have higher literacy skills are more likely to be a professional or manager, it is reasonable to believe that literacy skills may also account for some part of the differences in individuals' incomes.

Experience is also likely to be an important determiner of income. People who have been in a particular job for a number of years will have gained experience and developed skills directly related to the particular job that would be rewarded by greater compensation. Consequently when looking at the relationship between income and literacy, it is important to also consider the potential growth in income over an individual's career. Generally adults between the ages of 16 and 25 who are just starting their careers do not earn as much as adults who have been in the workforce for a number of years. In addition, there is a high probability that the best and brightest in this age group are enrolled in school. Consequently those in the labor force are likely to be atypical. To take this into account, we examined the relationship of literacy to income across five age groups – 16- to 24-year-olds, 25- to 34-year-olds, 35- to 44-year-olds, 45- to 54-year-olds, and 55- to 65-year-olds.

Figure 2.5 illustrates the relationship between literacy and earnings among American adults aged 16 to 65 who are in the labor force. The IALS survey reported income in quintiles based on the earnings of the entire population.[ix] This form of reporting income was chosen so that comparisons across countries might be made, not on the basis of the absolute monetary value of the income, but rather as it relates to relative economic success within each nation.

Figure 2.5 illustrates the relationship between literacy and earnings among U.S. adults aged 16 to 65 years of age who are classified as being in the labor force. The relationship between literacy and income is shown separately for each of five age groups: adults who are, respectively, 16-24, 25-34, 35-44, 45-54, and 55-65 years of age. Within each of the five age groups the average income for each of the four literacy levels is indicated on the vertical line shown. Each point on the line represents the average income of adults at the literacy level as indicated in the legend. With the exception of the 16-24-year-old group, the lowest point on each vertical line tends to be the average income of literacy level 1 adults, and the highest point tends to the average income of literacy level 4/5 adults. The average income of adults at literacy levels 2 and 3 tend to lie between these two points and in the order one would expect.

The measure of income available is a grouped measure, showing only the income quintile in which each person's income falls, not the actual income in dollars. Thus, the means displayed in Figure 2-5 are the means of the quintile scores. Using the 25-34-year-old group as an example, the data displayed in Figure 2-5 can be read as follows: adults at literacy level 1 have a mean income quintile of 2.4, those at literacy level 2 have a mean income quintile of 3.2, at literacy level 3 the mean income quintile is also 3.2, and at literacy level 4 the mean income quintile is 3.6.

As seen in Figure 2.5, there is consistency in the relationship of average income quintile to literacy level for each age group except the 16- to

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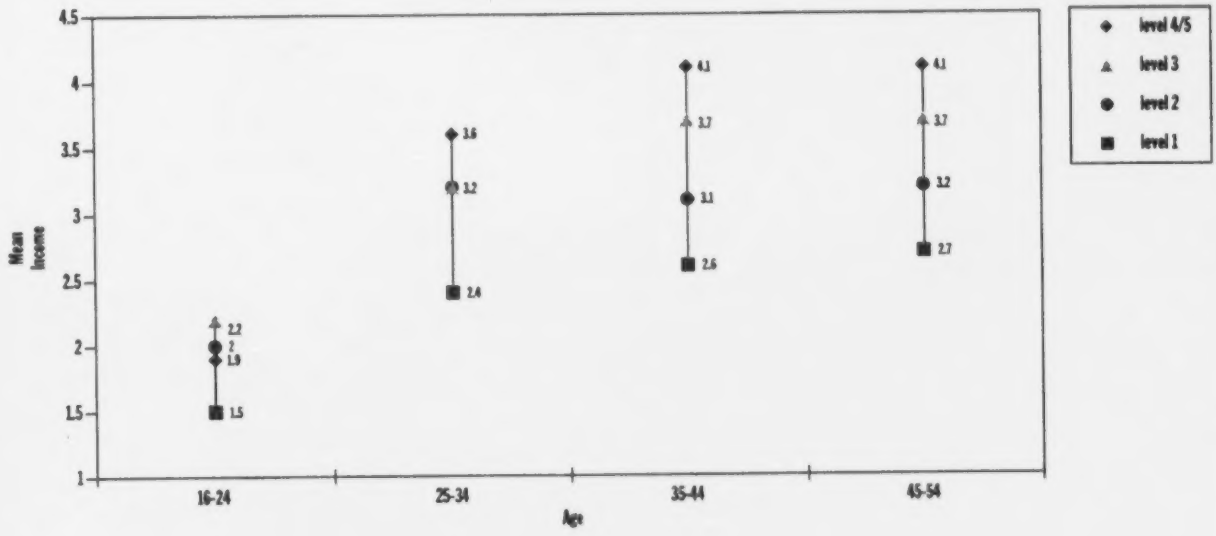
ix The term quintile means the separation of a given population into fifths. Within each country, an estimate of the earnings of the entire population was used to locate the income ranges in which exactly 20 percent of the population resides. The values for each country were then applied to that country's IALS sample.

Figure 2.5: Mean annual income quintile of U.S. adults age 16 to 65 by document literacy level by age: 1994



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

24-year-olds. In all cases, other than 16- to 24-year-olds, the average income quintile rises as literacy level rises; people at literacy level 1 always appear as the lowest point on each line, and people at literacy level 4/5 always appear as the highest point.

In the case of the youngest adults, people at literacy level 4/5 are at the second lowest level for income rather than at the top. This is a common finding for this age group and the usual explanation given is that these young adults are at the beginning of their occupational careers, a time of considerable instability, such that the relationships between individual attributes and income depart from the main trends observed for the population as a whole. Jobs, labor market status, and income levels all change in the short term in ways not characteristics of the adult population as a whole. In the present instance this fact is reflected in the lack of relationship between literacy and income for this age group. With the exception of the difference between the level 1 and level 3 means, none of the averages in question are significantly different from each other; in short, there is almost no relationship between literacy and income for the 16- to 24-age group.

Figure 2.6a – Mean annual income quintile of adults age 16 to 65 by document literacy level by age and nation: 1994; 25- to 34-year-olds

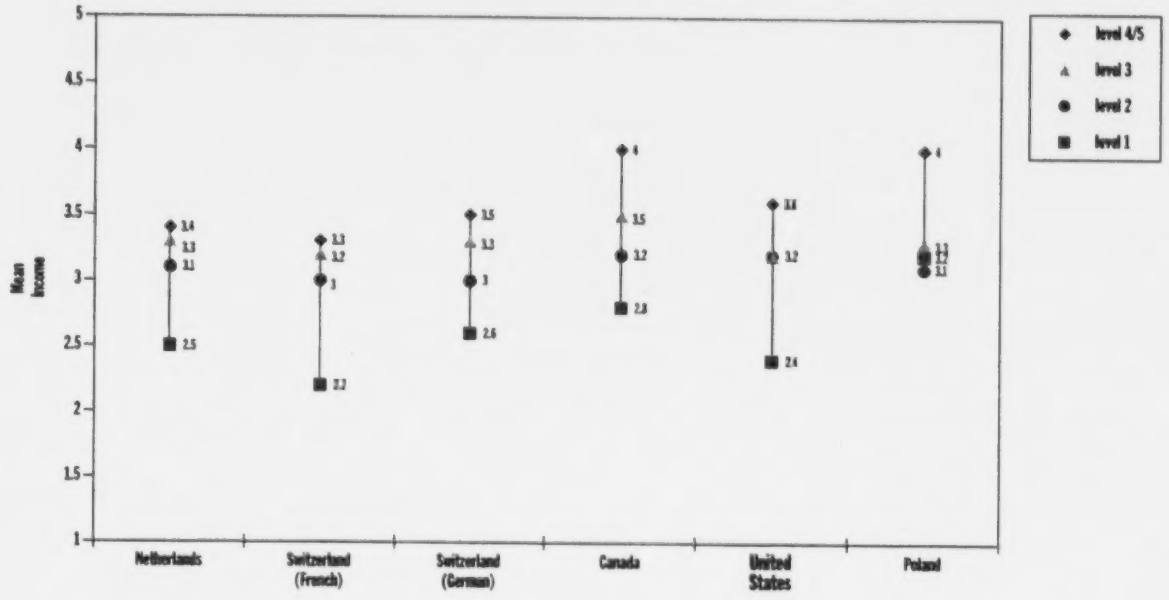


Figure 2.6b – Mean annual income quintile of adults age 16 to 65 by document literacy level by age and nation: 1994; 35- to 44-year-olds

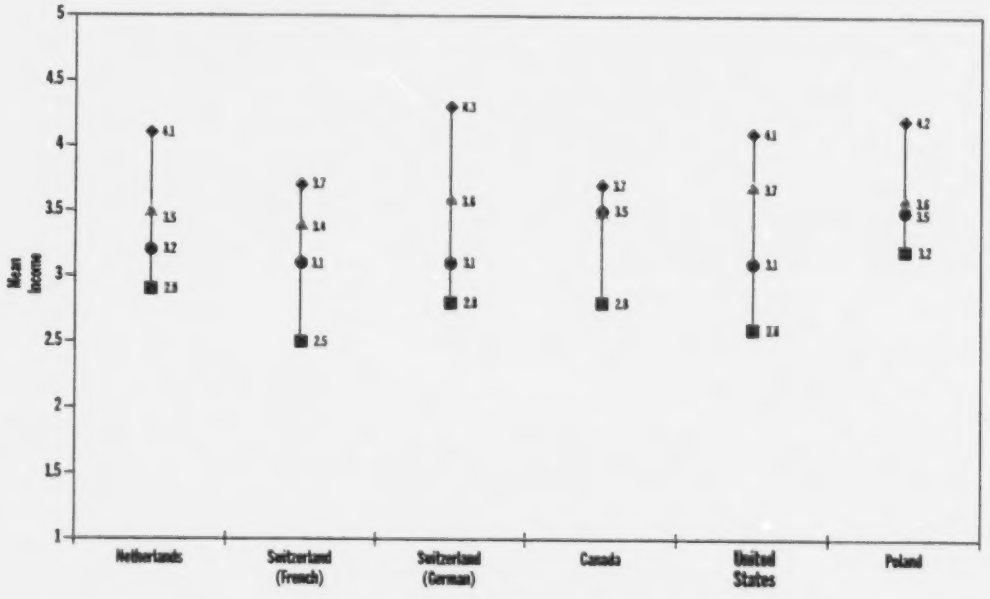


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Figure 2.6c – Mean annual income quintile of adults age 16 to 65 by document literacy level by age and nation: 1994; 45- to 54-year-olds

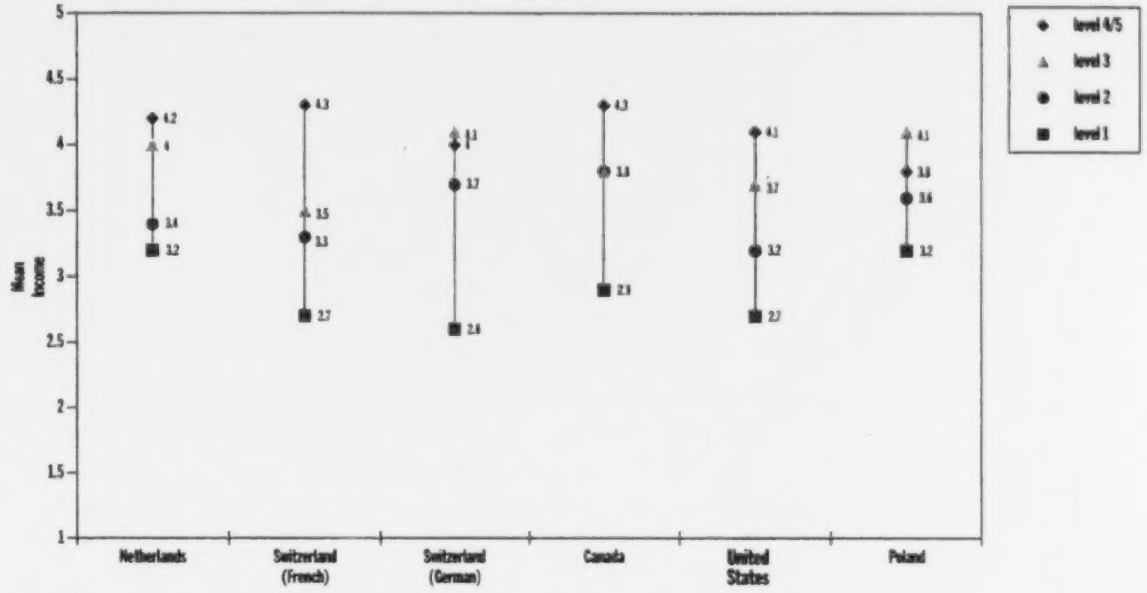
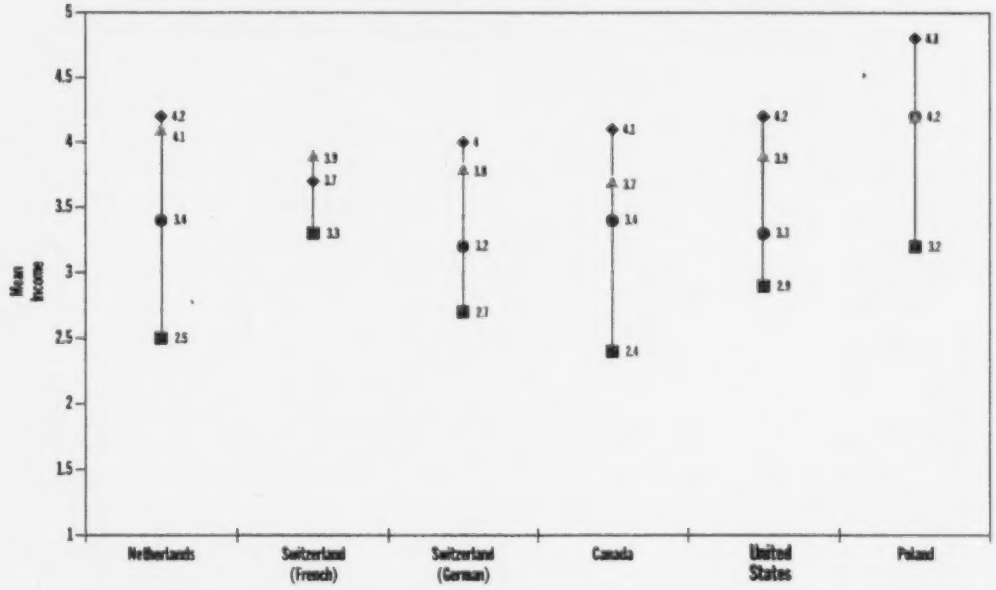


Figure 2.6d – Mean annual income quintile of adults age 16 to 65 by document literacy level by age and nation: 1994; 55- to 65-year-olds



SOURCE: Organization for Economic Cooperation and Development and Statistics Canada, 1994, unpublished tabulations.

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On the other hand, the remaining four age groups demonstrate a clear and consistent positive relationship between literacy level and income – as literacy increases, so does income.[x] For the 25- to 34-year-old group the average income for level 1 adults is significantly lower than that for adults at each of the other literacy levels. Differences between levels 2, 3, and 4/5 fail to reach statistical significance. The same pattern holds for the 35-44 and 45- to 54-year-old groups with two exceptions. For both age groups level 4/5 adults have a higher average income quintile than level 2 adults and the difference between mean income quintiles at levels 1 and 2 is not significant. For the oldest age group, 55- to 65-year-olds, the only difference between average income quintile that is statistically significant is that between the extremes – levels 1 and 4/5.

The data seem to demonstrate a clear pattern between literacy and income among U.S. adults even though only the differences involving the average income of level 1 adults reach statistical significance and show that, for the most part, the average income quintile of this group is lower than each of adults at each of the other literacy levels across all age groups.[xi] Given this demonstration of the apparent importance of literacy for income in the United States, the next step is to place this relationship in a perspective provided by the other IALS countries, with the view to exploring the generality of this finding.

Literacy and income across nations

Following the same pattern as in the preceding sections the relationship between literacy and income is portrayed for each participating nation. For reasons already noted, the data for the 16- to 24-year-old group are excluded from these presentations. Each of Figures 2.6a through 2.6d focus on a single age group and provide evidence of the relationship between literacy and income for five of the seven nations.[xii]

It is important to keep in mind that the income quintiles are nation-specific and thus the means as shown do not have the same monetary

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x Joining the means by literacy level across the age groups would convert the present display into a form similar to the familiar age-income curves and makes obvious that the income levels of literacy level 1 adults show relatively little growth over the working life of those concerned.

xi Subsetting the sample into age groups increases the size of the sampling error for these groups and, as a result, makes only the largest differences statistically significant.

xii Sweden and Germany are not included because they did not provide this data.

value across nations. That is, in the case of Figure 2-6a, for example, the monetary value of an average income quintile of 4 for Canadian adults at literacy level 4/5 is not equivalent to an average income quintile of 4 for literacy level 4/5 Polish adults. Similarly, it is not legitimate to infer that French-speaking Swiss adults at level 4/5 earn as much on average as German-speaking Swiss adults at level 3. However, the comparisons imply equivalent status within each nation's hierarchy.

The information displayed is remarkable for its consistency. Within each country and across all four age groups the relationship between literacy and income is one that shows a rise in income as level of literacy increases from level 1 to level 4/5. In most countries and age groups (except for the case of German-speaking Switzerland) levels 3 and/or 4/5 are higher than level 1.

Another way of looking at these data displays is to consider the length of the line as a measure of the strength of the relationship between literacy and income – the difference between the average level of income for level 1 adults and that for level 4/5 adults. The longer the line the greater the difference and the greater the income gap between the least and most literate citizens in each country. In most countries and most age groups the differences in average income quintiles between adults at level 1 and 4/5 is nearly an entire quintile or more. The only exception is in the 55- to 65-year-olds in French-speaking Switzerland. Since these are all working adults these most likely reflect differences in wage rates by literacy levels and not so much the effects of compensatory social welfare programs designed to redistribute income, though the latter cannot be ruled out. Irrespective, the general consistency of the relationship between literacy and income throughout the course of an individual's working life in each of the several countries examined here makes clear the benefits of both individual and national literacy capabilities.

The importance of literacy to individuals

The data on employment status, occupational status, and annual income as related to literacy level all indicate that a consistent relationship exists across countries. Within each nation there is a general trend indicating that as literacy levels increase:

There is a decrease in the proportion of adults who are out of the workforce and an increase in the proportion who are working.

The proportion of adults in blue-collar occupations decreases dramatically while the proportion of adults in managerial and professional occupations increases.

Income also increases.

These relationships support the belief that literacy skills are directly related to a person's ability to participate successfully in the workforce. This will become even more evident as economies continue their evolution from an agrarian to an industrial to an information base. While occupations associated with preceding economic configurations will continue to exist, both the number of jobs in particular sectors and the form that work will take are likely to evolve in ways that will depend on increasingly complex literacy skills.

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2 Organisation for Economic Cooperation and Development. (1988). *International standard classification of occupations.* Paris: OECD.,

3 Treiman, D. (1977). *Occupational prestige in comparative perspective.* New York: Academic Press

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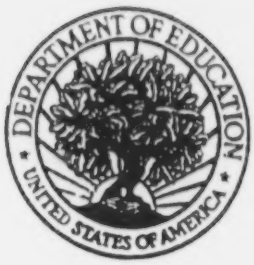
97-18 (June)	Improving the Mail Return Rates of SASS Surveys: A Review of the Literature	Steven Kaufman
97-19 (June)	National Household Education Survey of 1995: Adult Education Course Coding Manual	Peter Stowe
97-20 (June)	National Household Education Survey of 1995: Adult Education Course Code Merge Files User's Guide	Peter Stowe
97-21 (June)	Statistics for Policymakers or Everything You Wanted to Know About Statistics But Thought You Could Never Understand	Susan Ahmed
97-22 (July)	Collection of Private School Finance Data: Development of a Questionnaire	Stephen Broughman

Listing of NCES Working Papers to Date--Continued

Number	Title	Contact
97-23 (July)	Further Cognitive Research on the Schools and Staffing Survey (SASS) Teacher Listing Form	Dan Kasprzyk
97-24 (Aug.)	Formulating a Design for the ECLS: A Review of Longitudinal Studies	Jerry West
97-25 (Aug.)	1996 National Household Education Survey (NHES:96) Questionnaires: Screener/Household and Library, Parent and Family Involvement in Education and Civic Involvement, Youth Civic Involvement, and Adult Civic Involvement	Kathryn Chandler
97-26 (Oct.)	Strategies for Improving Accuracy of Postsecondary Faculty Lists	Linda Zimbler
97-27 (Oct.)	Pilot Test of IPEDS Finance Survey	Peter Stowe
97-28 (Oct.)	Comparison of Estimates in the 1996 National Household Education Survey	Kathryn Chandler
97-29 (Oct.)	Can State Assessment Data be Used to Reduce State NAEP Sample Sizes?	Steven Gorman
97-30 (Oct.)	ACT's NAEP Redesign Project: Assessment Design is the Key to Useful and Stable Assessment Results	Steven Gorman
97-31 (Oct.)	NAEP Reconfigured: An Integrated Redesign of the National Assessment of Educational Progress	Steven Gorman
97-32 (Oct.)	Innovative Solutions to Intractable Large Scale Assessment (Problem 2: Background Questionnaires)	Steven Gorman
97-33 (Oct.)	Adult Literacy: An International Perspective	Marilyn Binkley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